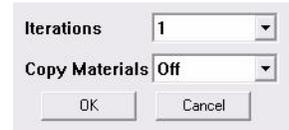


How to use

*Subdivide and
Smooth*

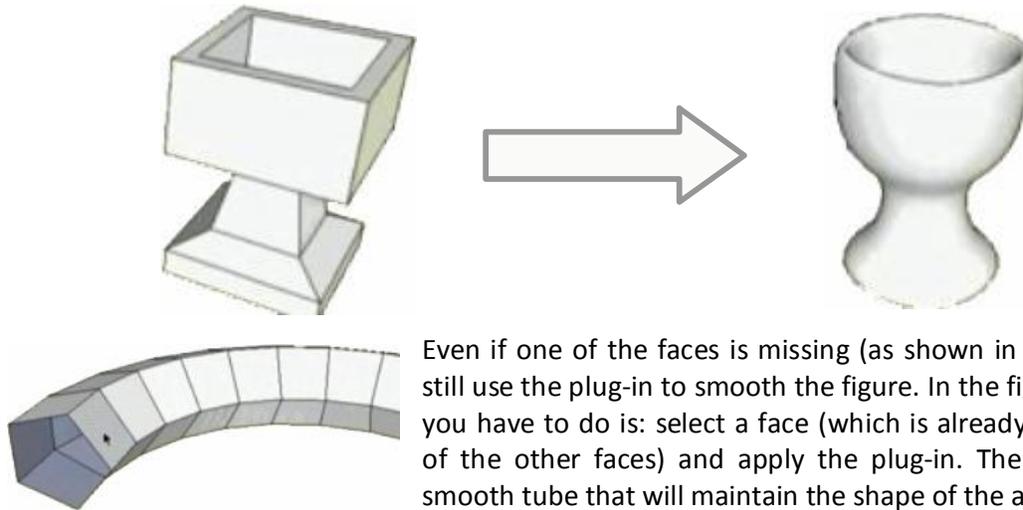
Hello and welcome. By reading this document, you will learn how to use **Subdivide and Smooth**. You will learn about the different functions that the plug-in can perform when being attributed to a figure.

In our first example, select a cube. Note that at the moment, the faces of the cube have not yet been grouped. By selecting one of the cube's faces and by pressing the first icon in the Subdivide and Smooth Toolbar, a dialogue will appear asking you for the number of iterations (between 1 and 4). Normally, **2** will suffice for most purposes. Click on **OK** and you will observe that the cube was transformed into a sphere.



Remember that no matter which of the cube's faces was selected all of the connected geometry will be affected.

For example, using the plug-in, it is possible to transform a rough/jagged geometrical body into a smooth one:

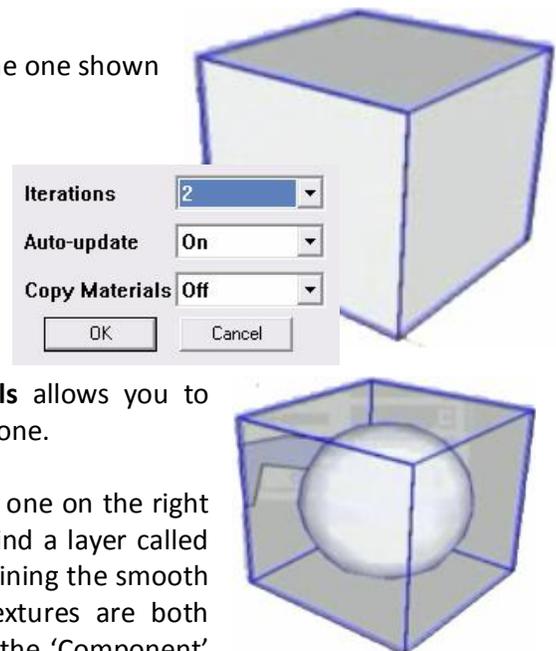


Even if one of the faces is missing (as shown in the figure) you can still use the plug-in to smooth the figure. In the figure to the left – all you have to do is: select a face (which is already connected with all of the other faces) and apply the plug-in. The result will show a smooth tube that will maintain the shape of the above shown figure.

We can also use the plug-in on a single face/side, if it's not connected to any other geometrical bodies. The plug-in will transform that face into a smooth surface.

If, however, we apply the plug-in on a grouped object like the one shown in the figure to the right, another dialogue greets us:

The first option is, again, the **number of iterations**. There's another option, **auto-updating** the object during the editing process. You'll normally want this option 'On' except for when your object is really big/has a great number of faces. Then, you might want to switch it off, because otherwise, it may take a long time for the object to update after every edit. The option to **Copy Materials** allows you to transfer the textures from the original object to the smooth one.

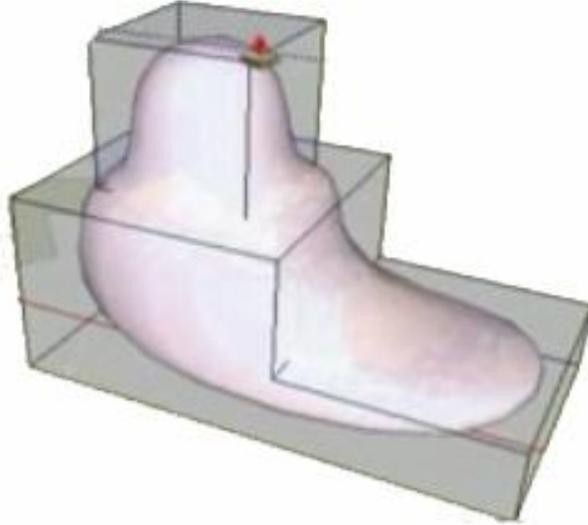


When you click on **OK**, you will see an image similar to the one on the right (below). By opening Sketch Up's 'Paint' window, you can find a layer called *Subsurf_Proxy*. This is the material applied to the box containing the smooth figure. There's another material called *Subsurf*. These textures are both editable (ie You can change their colors, etc). If you open the 'Component'

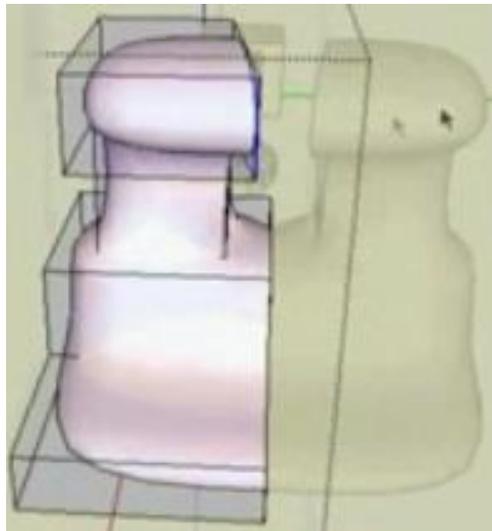
window, you'll notice that a new component named *Subsurf* was created.

To edit the smooth figure, double-click on it. You will be able to use the SketchUp tools to edit it. If the **auto-update** feature was turned 'On' you will be able to see the figure change its shape in real time, as you edit.

The plug-in is great for the creation of smooth, organic objects and, is quite fast because it uses a relatively low number of polygons. In the following picture, you can see a figure created with the plug-in.



The advantage of applying the plug-in on a grouped object is that you can easily drag and drop an identical copy from the 'Components' panel. That could help you create a mirror image of your object. To do that, delete the adjacent face of the object you want mirrored, then resize the object in the negative direction until it clicks onto your first object. Note that any changes made onto one of your objects will be inflicted on both of them.



To edit the properties of the object after having created it, you have to double-click on the object, left-click and then select one of two available options from the menu:

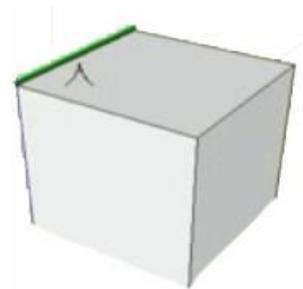
- **Edit subdivision proxy**

This opens the window you saw when you first created the object. You can, for example, change the number of iterations here.

- **Update subsurface**

This allows you to manually update the figure you are editing if you have previously turned the **auto-update** feature off. Also, if you did turn auto-updating on and for some reason it didn't auto-update properly, you can use this option to manually update the shape.

Sometimes, you may need to not smooth one of your shapes' edges or vertices. To prevent the plug-in from smoothing, click on the **'Crease Tool'** button and then click on the edge or vertex you wish not to be smoothed. The edges/vertices to be smoothed will be marked in **red**, and the ones to be left alone - in **green**. To see the effect, press the **'Subdivide and Smooth'** button.

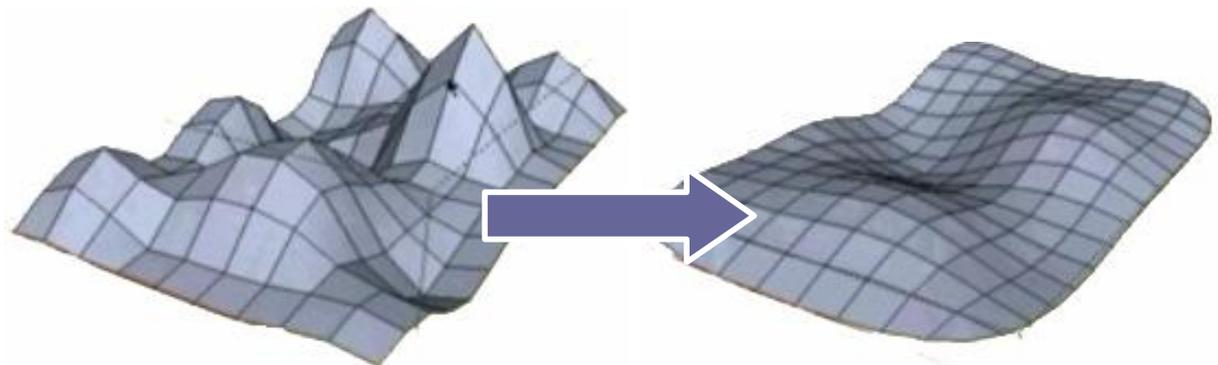


To smooth only one face/side, you click on that face and then click on the 'Subdivide Selection' button. The option to smooth only one face is especially used with another plug-in called 'Sketchy Deformation'. With the two, you'll be able to create shapes like the one to the left.

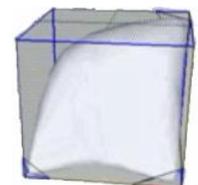


Another important function included in this plug-in is the **'smooth all connected geometry'**. This is the third icon in the toolbar. It averages the vertex positions of a particular figure. However, the tool only works on faces with 3 or 4 vertices. The result is a smoother geometry, as you can see in the figure to the left.

You could also use the tool on a previously smoothed figure. This could potentially be very useful if you plan on creating smooth terrain. You can see the effect in the picture below.

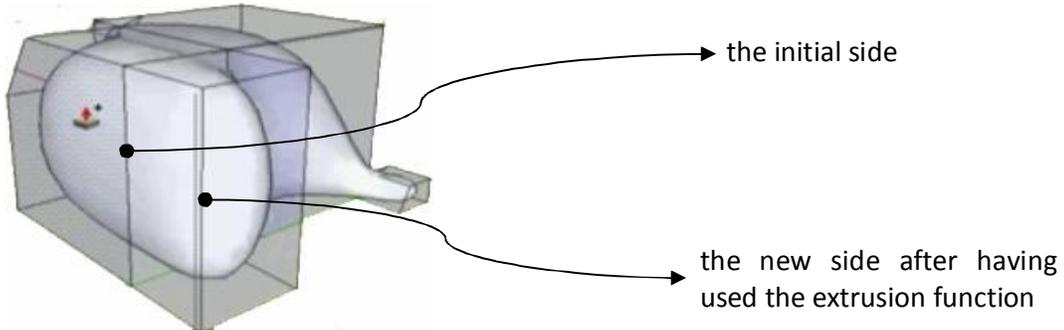


There are two more functions included with the plug-in. One of them is the **'Knife'**. To use it, create a smooth figure and then double click it. All you have to do is drag the knife over one of the faces. This will create a new face. An example of how that works can be seen to the right.



Warning : The 'knife' tool can cause SketchUp to crash and so you could lose your model. That's why it is recommended that you first save your model and only then use the tool.

The last function is represented by the last icon – it's the **extrusion** tool. This will allow you to create a figure ready for future modifications. In short, by clicking on the extrusion button, you're performing an operation identical to the 'Push/Pull' one, with one little exception – regardless of where you 'Push/Pull' the new face, the old one remains in place.



You might find little holes in certain objects if you use the extrusion tool. That's caused by the unnecessary faces created in the extrusion process. To rectify that, simply delete the non-necessary faces.

One last advice - assign shortcuts to the different Subdivide and Smooth toolbar buttons. Good luck.